

EXHIBIT E

PART 1

EXPERT REPORT OF MICHAEL L. HARTZMARK, PH.D.
ON THE MARKET EFFICIENCY OF DVI, INC. COMMON STOCK
AND SENIOR NOTES

IN RE DVI, INC. SECURITIES LITIGATION

Highly Confidential

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1. I, Michael L. Hartzmark, have been asked by counsel for the lead Plaintiffs for the putative Class ("Class") in the matter of In re DVI, Inc. Securities Litigation ("DVI") to determine whether DVI common stock ("common stock") and DVI 9-7/8 Percent Senior Notes due in 2004 (the "Notes") traded in efficient markets from August 10, 1999 to August 13, 2003 (the "Class Period").

2. For the purposes of this report, when I use the term "efficient market" I am referring to an active securities market that includes many well-informed and rational investors competing with one another to predict future securities prices; with the result that at any given point in time, securities prices reflect all available information (about past and anticipated future events) and securities prices quickly adjust to unanticipated disclosures.

3. I have made no investigation of the issues surrounding liability in this case. My report applies appropriate and rigorous economic, financial and statistical analysis to determine whether the securities at issue were traded in efficient markets.

4. My report is organized as follows: In section I, I present my qualifications as an expert. In section II, I summarize my opinions. In section III, I present an efficient market analysis related to DVI common stock. In section IV, I present an efficient market analysis related to DVI Notes. In section V, I present an efficient market analysis related to the interaction between DVI's two tranches of Notes. In Section VI, I present my conclusions.

I. QUALIFICATIONS

5. I am an economist and a Vice President at Chicago Partners, LLC, a firm of professional economists and accountants based in Chicago. I specialize in the application of economics and finance to legal, commercial and regulatory issues, including issues such as those addressed in this report. I earned my B.A. in economics from The University of Michigan in 1978 and my M.A. and Ph.D. in

economics from The University of Chicago in 1982 and 1984, respectively. I have taught economics and financial economics in the Department of Economics at The University of Chicago and in both the Graduate School of Business and the Department of Economics at The University of Michigan. At The University of Michigan I created and taught courses on Futures Markets that included discussions of financial futures contracts.

6. I also have substantial business experience. From 1993 to 2004, I was Chairman and CEO of Cragar Industries, Inc. ("Cragar"). I recently concluded service as Interim Chief Financial Officer of Pacific Biometrics, Inc. where I was responsible for overseeing all of the company's accounting functions and for drafting and filing the Company's SEC reports. In addition, I have served on a number of Financial Advisory Boards, and public and private Boards of Directors.

7. Previously, I was employed as a Financial Economist at the Commodity Futures Trading Commission. I earned my series 7 and 63 registered representative licenses and have served as a Financial Advisor at Fahnstock & Co., Inc. (now Oppenheimer & Co., Inc.) I am also founder and President of DARMA, LLC, a wealth and asset advisory company affiliated with Oppenheimer & Co., Inc.

8. I have offered expert economic testimony and expert reports on securities matters, complex commercial disputes, and mergers and acquisitions. I have also provided expert economic advice to numerous law firms and businesses in connection with mergers, acquisitions, securities and complex commercial disputes, among other matters. In addition, I have consulted with management, boards and investor groups on a variety of commercial matters, including the issuance and pricing of corporate equities and debt.

9. I am a member of the American Economics Association, National Association of Forensic Economics and the American Finance Association.

10. My qualifications are summarized in greater detail in my *curriculum vitae*, which is attached to this report as Appendix A. Appendix A also contains information relating to my expert engagements and publications. Chicago Partners is being compensated at \$360 per hour for my work in this matter. My compensation does not depend upon the conclusions contained in this report or in any supplemental report prepared pursuant to this engagement, nor does it depend upon the ultimate resolution of this case.

II. SUMMARY OF OPINIONS

11. Based on my analysis to date, I have formed the following opinions:

- a) The evidence supports the conclusion that DVI common stock traded in an efficient market during the Class Period.
- b) The evidence supports the conclusion that DVI's first tranche of Notes that were registered with a SEC Form S-3 traded in an efficient market during the Class Period.
- c) The evidence supports the conclusion that DVI's second tranche of Notes that were not registered with a SEC Form S-3 traded in an efficient market during the Class Period.

12. In reaching these opinions, I have reviewed and considered various materials, which are listed in Appendix B. The research and analysis upon which my opinions are based has been conducted by me with the assistance of Chicago Partners personnel working under my direction and supervision. My conclusions are based on information available to me as of the date of this report. My work is on-going, and I will continue to review, evaluate, and analyze relevant material as it becomes available. If I receive additional material information, I will supplement this report accordingly.

III. EFFICIENT MARKET ANALYSIS RELATED TO DVI COMMON STOCK

A. Bases for Opinion on Efficiency of the Market for DVI Common Stock

13. I understand that fraud-on-the-market securities litigation generally requires that the security be traded in an efficient market. In this section, I evaluate whether DVI common stock traded in an efficient market.

14. The *Cammer* court identified five factors that it deemed useful in determining whether a market for a security is efficient.¹ In forming my opinion in this matter on whether DVI common stock traded in an efficient market, I have considered each of these five *Cammer* factors, including:

- a) the average of the weekly turnover of DVI common stock;²
- b) the number of analysts that followed and reported on DVI common stock;
- c) the number of market makers;³

¹ *Cammer v. Bloom*, 711 F. Supp. 1264 (D.N.J. 1989). Other courts have also examined this issue. See for example, *Freeman v. Laventhol & Horwath*, 915, F.2d 193 (6th Cir. 1990) and *Krogman v. Sterritt*, 202 F.R.D. 467 (D.TX. 2001).

² Weekly turnover is equal to total weekly trading volume divided by the outstanding number of shares at the end of the week.

³ The NASD defines a market maker as a “firm that maintains a firm bid and offer price in a given security by standing ready to buy and sell at publicly quoted prices.” The security at issue in the *Cammer* matter traded in the over-the-counter market, which because it is a decentralized market often requires the use of market makers to assist in creating an efficient trading market. DVI did not require market makers since the common stock traded on the New York Stock Exchange (“NYSE”). In the case of NYSE-traded securities the exchange assigns a single dealer, called the specialist, to each security traded on the NYSE. Specialists in a centralized exchange play a similar role as market makers in decentralized markets.

- d) DVI's eligibility to file a SEC Form S-3 Registration Statement⁴; and
- e) the reaction of DVI common stock price to unexpected news events.

15. In addition to these factors listed above, I have also examined certain other factors that have been considered by the courts and/or discussed in academic literature, including:

- a) the market capitalization of DVI;
- b) the size of the float of DVI common stock (i.e., the percentage of outstanding shares held by non-insiders);
- c) the level of institutional ownership and arbitrage opportunities; and
- d) whether the returns on DVI common stock exhibit autocorrelation.⁵

B. The Cammer Factors

Cammer Factor I -- Weekly Trading Volume

16. The *Cammer* opinion states that: "average weekly trading of two percent or more of the outstanding shares would justify a strong presumption

⁴ This filing is the most simplified registration form and it may only be used by companies which have reported under the 1934 Act for a minimum of three years and meet the timely filing requirements set forth under Form S-2. The filing company must also meet the stringent qualitative tests prescribed by the form.

⁵ Autocorrelation or serial correlation measures the degree to which security returns in a given period are related to the returns in another past or future period. When returns exhibit zero serial correlation they are considered to be random and thus unpredictable.

that the market for the security is an efficient one; one percent would justify a substantial presumption.”⁶

17. The outstanding shares of DVI common stock during the Class period ranged from 14.1 million to 15.2 million. The reported trading volume over the whole Class Period was approximately 52.8 million shares (See Appendix C). This total trading volume represents almost four times DVI’s average of common stock outstanding during the Class Period.

18. In Exhibit I, I show the average of weekly trading as a percentage of outstanding shares (or turnover) of DVI stock is 1.70 percent.⁷ The range of average weekly turnover is from 0.18% (during the four day week of April 9, 2001) to 48.63% (during the week of August 4, 2003).

19. The relatively high average weekly turnover of DVI common stock is evidence supporting the conclusion that DVI common stock traded in an efficient market during the Class Period.

Cammer Factor II -- Analyst Coverage

20. Numerous reports analyzing DVI were published during the Class period. Exhibit II lists the analyst reports during the Class Period. These analysts were employed by major brokerage firms, including U.S. Bancorp Piper Jaffray, Inc. and CIBC World Markets Corp., as well as analysts employed by Duff & Phelps Credit Rating Co., Fitch and Banc One Capital Markets all published reports on DVI during the Class Period.

⁶ *Cammer v. Bloom*, 711 F. Supp. 1264 (D.N.J. 1989), page 1286.

⁷ “Average weekly trading” is computed as the average over 209 weeks (i.e., the length of the Class period) of the sum during the week of the daily volume divided by the number of shares outstanding at the end of the week. I have included all weeks, even if trading took place in fewer than five business days (e.g., included holidays).

21. The continuous coverage of DVI by investment professionals is evidence supporting the conclusion that DVI common stock traded in an efficient market during the Class Period. In addition, there were numerous press releases, news stories, and other media coverage throughout the Class Period. (See Appendix F for a chronology of disclosures.)

Cammer Factor III -- Market Makers

22. The third Cammer factor relates to stocks traded over-the-counter or on NASDAQ because these stocks are not traded on a centralized marketplace they often include the trading by multiple market makers. The New York Stock Exchange ("NYSE"), where DVI common stock traded throughout (and prior to) the Class Period, assigns a single dealer, called the specialist, to each security traded on the NYSE.⁸

23. The structure of the NYSE, including the specialist system, in combination of the rigorous listing procedures required for listing, leads to the general presumption that common stocks traded on the NYSE trade in an efficient market.⁹

⁸ According to the NYSE, a specialist is, "A market professional who manages the two-way auction market trading in the specific securities he or she has been assigned. He or she works for a specialist firm, which is an independent company in the business of trading listed securities."

⁹ According to the NYSE: "As the world's largest stock exchange, the NYSE plays a unique role in providing deep and liquid markets for all categories and sizes of market participants. To measure the quality of its market, the NYSE looks at the following areas: price, liquidity, volatility, execution speed and certainty of execution. As the data throughout this section shows, the NYSE continually provides the best prices, the most liquidity, the lowest trading costs, the lowest volatility and excellent transaction speed and certainty."

The markedly lower level of intraday volatility on the NYSE has been shown in numerous studies, including a recent analysis conducted by the SEC's Office of Eco-
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Cammer Factor IV -- SEC Form S-3 Eligibility

24. The fourth *Cammer* factor states that eligibility to file a SEC Form S-3 "...is an important factor weighing in favor of a finding that a market is efficient."¹⁰ DVI was not only eligible to file, but filed a SEC Form S-3 on numerous occasions listed in Exhibit III for both its common stock and Notes, including twice during the Class period (on August 31, 2001 and January 29, 2002). In addition, DVI filed two prospectuses filed on SEC Form 424B5 related to two public offerings for the Notes. These would include much of the same information as required in a SEC Form S-3.

25. Not only must the SEC deem the SEC Form S-3 registration statements effective prior to any company issuing public securities, but in the case of DVI, underwriters distributed the securities based on their own due diligence and information gathering process.

26. The fact that DVI was eligible to file on a SEC Form S-3 is evidence supporting the conclusion that DVI common stock traded in an efficient market during the Class Period.

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nomic Analysis. The analysis – conducted in December – looked at the volatility of 91 stocks that switched to the NYSE from NASDAQ between April 2001 and January 2004. The study found that, on average, stocks experienced a significant decline in intraday volatility once they switched to the NYSE. Specifically, the SEC found a steep slide in "transitory volatility," which is most likely attributable to market-center differences. Transitory volatility reflects short-term deviations of stock prices away from their fundamental or "true" values. Under a rigorous test, the analysis found that transitory volatility on average dropped 64 percent when stocks moved to the NYSE. The findings support earlier studies by the Exchange. In an analysis of 51 companies that switched to the NYSE from NASDAQ in 2002 and 2003, the NYSE calculated an average 50 percent drop in intraday volatility."

¹⁰ *Cammer v. Bloom*, 711 F. Supp 1264 (D.N.J. 1989), page 1285.

Cammer Factor V -- Price Reaction to Unexpected New Information

27. The fifth *Cammer* factor is "...a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price."¹¹ The opinion states that: "...one of the most convincing ways to demonstrate [market] efficiency would be to illustrate, over time, a cause and effect relationship between company disclosures and resulting movements in stock price."¹²

28. To detect whether the price of DVI common stock reacted in a reasonable and timely fashion to disclosures of unanticipated information, I performed an event study. Event studies are widely used in academia, litigation matters and investment practices, and have been a standard statistical procedure used by financial economists for over thirty years. They are generally used to measure the reaction of market participants (and thus the security price) to the disclosure of new information.

29. To carefully implement an event study, one begins by separating the impact on security price movements of market- and industry-wide factors from firm-specific factors.

30. To implement the event study related to DVI common stock, I adjust the daily percentage returns on DVI common stock for market-wide and industry-wide effects by performing a linear regression using what financial economists call the market model. In this market model the daily percentage return of DVI common stock is the dependent variable, while the independent variables include: a) the daily percentage return to the overall stock market (the proxy for this is the S&P 500 Index), b) the daily percentage return on a portfolio

¹¹ *Cammer v. Bloom*, 711 F. Supp 1264 (D.N.J. 1989), page 1287.

¹² *Cammer v. Bloom*, 711 F. Supp 1264 (D.N.J. 1989), page 1291.

of small-capitalization stocks (the proxy for this is the Russell 2000 Index), and c) the daily percentage return of an index of “peer” companies.¹³ The market model enables me to eliminate from the daily returns of DVI common stock the affects of the general stock market, the stock market for small capitalization companies and peer companies.

31. To estimate the parameters of the market model I use data from the two years immediately preceding the Class Period. The parameters describe statistically the relationship between the returns of the Indexes and the returns of DVI common stock.

32. The regression results are presented in Exhibit IV. I use the statistics from the regression to determine whether DVI’s daily adjusted return is outside of the range of volatility expected for the daily returns on DVI common stock. When the adjusted daily return is outside of the expected range of volatility it is considered for that day to have an “abnormal return.”

33. The daily stock prices and abnormal returns are plotted in Exhibit V (note, this is two pages – A and B). I have identified 34 days when the abnormal returns are outside of the expected range of volatility – e.g., are statistically different from zero at the one percent significance level.¹⁴

34. In conjunction with the event study I also examine public disclosures (e.g., press releases, analyst reports, newspaper stories, company filings,

¹³ These peer companies were disclosed in DVI’s SEC filings and include Finova Group, Inc., Financial Federal Corp., Medallion Financial Corp., Microfinancial, Inc. and Resource America, Inc. In Appendix D, I show \$100 charts comparing the returns of DVI to the returns of its peer group (both individually and as a group), in addition to certain market indexes.

¹⁴ This is the case when the t-statistic associated with the daily abnormal return is greater than 2.58.

etc.) to determine whether there is any “cause and effect” related to the disclosure of information related to DVI and the observed abnormal returns. The important company disclosures are summarized in text boxes in Exhibits V (parts A and B), along with the related abnormal returns.

35. In Appendix F, I present the voluminous daily chronology including DVI common stock prices, returns, volumes, abnormal returns and levels of statistical significance along with any company disclosures. This chronology also demonstrates the depth of the media coverage of DVI.¹⁵

36. The results in Exhibits V, in addition to the full chronology, shows that DVI common stock price generally reacts quickly to new information, which is consistent with an efficient market.

C. Other Factors to Weigh When Examining Market Efficiency

37. In addition to those Cammer factors listed above, I have also considered additional factors that have been considered by the courts and/or discussed in academic literature.

Other Factor I -- Market Capitalization

38. In *Krogman v. Sterritt*, 202 F.R.D. 467 (D.TX. 2001) the court suggested, “Market capitalization, calculated as the number of shares multiplied by the prevailing share price, may be an indicator of market efficiency because there is a greater incentive for stock purchasers to invest in more highly capitalized corporations.”

¹⁵ During the Class Period, numerous news stories about DVI appeared in leading financial publications, including *The Wall Street Journal*, *Barron's*, Dow Jones News Service, PRNewswire, Business Wire, and Bloomberg. By itself it might be considered that the broad dissemination of information about DVI through the media, analyst reports and regular SEC filings is evidence supporting the conclusion that DVI securities traded in an efficient market during the Class Period.

39. During the Class Period DVI's daily market capitalization ranged from a high of approximately \$300 million to \$12 million after the negative disclosures. (See Exhibit VI).

40. To determine whether this is a highly capitalized company, I show in Exhibit VII that DVI's market capitalization places it above the median size of all public companies which have their securities trading on the NYSE, American Stock Exchange and NASDAQ. Generally, DVI ranked in the top half of all companies trading on these stock markets. Only toward the end of the Class Period did DVI's market capitalization fall to a level that placed it at the median rank. Even at this time, DVI remained larger in market capitalization than one-half of the companies that traded on these three public stocks markets.

41. DVI's relatively large market capitalization is evidence supporting the conclusion that DVI common stock traded in an efficient market during the Class Period.

Other Factor II -- Float

42. In *Krogman v. Sterritt*, 202 F.R.D. 467 (D.TX. 2001) the court suggested that the higher the float (shares held by the public) the higher the likelihood of market efficiency "because insiders may have private information that is not yet reflected in stock prices, the prices of stocks that have greater holdings by insiders are less likely to accurately reflect all available information about the security."

43. In Exhibit VIII, I show the insiders held less than 25 percent of the DVI common stock over the Class Period.¹⁶ Insiders often have restrictions on

¹⁶ Public float is defined by most companies as shares outstanding less shares held by executive officers and board members. In the case of DVI, I understand from Counsel that the insider group holdings included the large block held by CIBC Trust
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their ability to trade their public securities and this relatively small proportion of insider holdings indicate these restrictions would have little impact on the ability to buy and sell DVI common stock.

44. DVI's large public float of common stock is evidence supporting the conclusion that DVI common stock traded in an efficient market during the Class Period.

Other Factor III – Institutional Holdings and the Existence of Arbitrage Opportunities

45. During the Class Period, institutions, which are entities with investment discretion over \$100 million or more, held between 43 percent and 75 percent of DVI's shares outstanding (See Exhibit VIII).¹⁷ In addition, Exhibit IX

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Company on behalf of the Pritzker Family. From DVI's proxy statements, I found that during the Class Period CIBC held on behalf of the Pritzker family approximately 2.54 million shares or between 17.5 and 18.0 percent of the outstanding shares of DVI. These shares are included in the insider holdings in Exhibit VIII.

¹⁷ For securities traded on major U.S. exchanges, such as the NYSE, NASDAQ and AMEX, FactSet LionShares gathers institutional ownership information via 13F filings as well as by "rolling up" the sum of shares held by the mutual funds managed by a particular institution. The SEC's rules state: "Institutional investment managers that use the United States mail (or other means or instrumentality of interstate commerce) in the course of their business and that exercise investment discretion over \$100 million or more in Section 13(f) securities must file Form 13F. An institutional investment manager is an entity that either invests in, or buys and sells, securities for its own account. For example, banks, insurance companies, and broker/dealers are institutional investment managers. So are corporations and pension funds that manage their own investment portfolios. An institutional investment manager is also a natural person or an entity that exercises investment discretion over the account of any other natural person or entity. For example, an investment adviser that manages private accounts, mutual fund assets, or pension plan assets is an institutional investment manager. So is the trust department of a bank. A trustee is an institutional investment manager, but a natural person who exercises investment discretion over his or her own account is not an institutional investment manager."

lists 137 institutions that held DVI common stock during the Class Period.¹⁸ This set of institutional traders, which participated in the market for DVI common stock suggests a large group of sophisticated investors were participating in the market.

46. The large volume of shares held and traded by sophisticated institutional shareholders who (along with the short sellers) could act as arbitrageurs facilitates an efficient market. In addition, shares held by institutions are often available for borrowing by short sellers. Thus, the large volume of shares held by institutional shareholders also contributes to an efficient market by assisting in facilitating any short sales arbitrageurs wished to make.

47. The amount of short interest in DVI common stock during the Class Period ranged from 1,718 shares to 384,557 shares, with an average short interest of 59,120. (See Exhibit X).¹⁹ This range of short interest suggests that arbitrageurs had the opportunity to sell short the common stock and that there was an active market. It indicates that short-selling of DVI common stock was not constrained during the Class Period and that potential arbitrage opportunities, if available, could be exploited.

48. DVI's relatively large institutional holdings and short interest both provide evidence supporting the conclusion that DVI common stock traded in an efficient marketing during the Class Period.

Other Factor IV -- Statistical Test for Autocorrelation

49. Finally, I conduct a statistical test using the regression reported in Exhibit IV to determine whether the daily returns of DVI common stock (net of

¹⁸ The holdings of CIBC Trust Company on behalf of the Pritzkers are documented in DVI's proxy, but these are not defined as institutional holdings.

¹⁹ Prior to the Class Period short interest rose as high as 611,570 shares.

market and industry effects) exhibit autocorrelation. Significant autocorrelation implies a statistical relation between stock returns over consecutive days (e.g., the return today will enable an investor to predict the return tomorrow). Significant autocorrelation in the returns could indicate a violation of market efficiency.

50. The statistical test I perform shows no significant autocorrelation for DVI's stock returns at the five percent level of statistical confidence,²⁰ which is consistent with the conclusion that the market for DVI common stock is efficient.

IV. EFFICIENT MARKET ANALYSIS RELATED TO DVI NOTES

A. Discussion of the Corporate Bond Market

51. The corporate bond market is primarily an institutional market. Most trading takes place over-the-counter, where the potential bond trader cannot observe all quotes on a centralized exchange or on a computer screen. Instead, the institution must call several dealers for quotes or broadcast a list of bonds to sell (or buy) to various dealers through Bloomberg, a vendor of quotes and financial information that is popular with institutions.²¹

²⁰ To test for autocorrelation I use a Durbin-Watson test. A Durbin-Watson statistic close to a value of two indicates no autocorrelation. The Durbin-Watson statistic computed for DVI from the regression reported in Exhibit IV is approximately 1.8.

²¹ In April 1994, NASD began an electronic quotation and surveillance system for high-yield bonds known as the fixed income pricing system (FIPS). The goal of FIPS was to facilitate the price discovery mechanism for corporate bonds by making it easier for investors to track bond prices, volume and transactions. Source: (NASD and Hotchkiss, E. and Tavy Ronen, "The Informational Efficiency of the Corporate Bond Market: An Intraday Study," The Review of Financial Studies, 15 No. 5, 1325-1354 (Winter 2002).)

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52. Corporate bonds also trade on the NYSE, a centralized exchange where there are readily available price quotes. Estimates suggest that approximately 10 percent of all corporate bond trades are made on the NYSE.²²

53. The price or yield²³ of corporate bonds is determined by four components:

- a) the required rate of return on risk-less debt (i.e., government bonds);
- b) the various provisions and restrictions associated with the particular bond (e.g., call terms, seniority in the event of default, maturity date, etc.);
- c) the probability that the company will be unable to satisfy some or all of the indenture requirements; and
- d) the likelihood of being able to sell the corporate bond in a liquid market.²⁴

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In July 2002, NASD initiated a program known as the Trade Reporting and Compliance Engine (TRACE), in which the individual members of the NASD report all of their corporate bond transactions. "The Trade Reporting and Compliance Engine is the NASD developed vehicle that facilitates the mandatory reporting of over the counter secondary market transactions in eligible fixed income securities. All broker/dealers who are NASD member firms have an obligation to report transactions in corporate bonds to TRACE under an SEC approved set of rules." (Source: NASD website.)

²² Hwon, G. and A. Warga, "An Empirical Study of Bond Market Transactions," Financial Analysts Journal 56, 32-46 (2000) states, "The market for corporate bonds is conducted in both an exchange and a dealer environment. At least 90 percent of trades are carried out in the dealer market...."

²³ The price of a fixed coupon bond is inversely related to its yield. This means that as bond prices fall, the yield rises.

²⁴ The first three components of the value of a corporate bond are discussed in detail in R. Merton, "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates,"

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54. Changes in these variables explain most of the variation in the prices/yields of corporate bonds. Therefore, changes in corporate bond prices/yields are a function of changes in risk-less rates of interest, changes in the company's likelihood of default and changes in the liquidity.

55. Most of the variation in the prices of *investment-grade bonds*²⁵ comes from fluctuations in interest rates, as opposed to firm-specific information. Therefore, bid and ask quotes for *investment-grade bonds* are provided in terms of additional basis points of yield over a comparable treasury security. Thus dealers can usually provide a quote by comparing the bond with other bonds with similar maturities, coupon rates, bond rating, and call provisions and then estimating the yield spread between the bond and the treasury security.

56. Although *high yield bonds* are also sensitive to changes in interest rates, firm-specific factors have a greater impact on their value. Therefore, it is the practice that *high yield bonds* are quoted in dollars rather than in terms of a premium from treasury yields. As a result, dealers cannot easily determine an appropriate quote for *high yield bonds* by comparing the corporate bond to others of similar rating, coupon, and maturity.

B. Market Efficiency for DVI Notes

57. As was discussed above in Section III, the *Cammer* court identified five factors that it deemed useful in determining whether a market for a security is efficient. Even though the mechanisms and institutions associated with equity

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The Journal of Finance 29, 449-470 (1974). Other articles discuss tax effects, but that discussion is not important in this report.

²⁵ An investment grade bond is assigned a rating in the top four categories by commercial credit rating companies. S&P classifies investment-grade bonds as BBB or higher, and Moody's classifies investment grade bonds as BAA or higher. (See Appendix E for a complete description of Standard and Poor's Criteria and Definitions for Credit Ratings.)

and debt markets are slightly different, in forming my opinion in this matter on whether DVI Notes traded in an efficient market, I first consider each of the five *Cammer* factors.

58. In addition to the five *Cammer* factors, I also consider certain factors that have been considered by the courts and/or discussed in academic literature, including:

- a) the level of institutional ownership; and
- b) whether the returns on DVI Notes exhibit autocorrelation.

59. The total amount at face value of the DVI Notes was \$155,000,000. DVI issued two tranches of Notes, in the amounts of \$100,000,000 ("DVI #1") and \$55,000,000 ("DVI #2"), respectively. The first tranche was issued on January 30, 1997, while the second tranche was issued on December 16, 1998. The only difference between the two notes was that the first tranche was registered using a SEC Form S-3 to trade on the NYSE, while the second tranche was not registered using a SEC Form S-3 to trade on the NYSE. Otherwise, the two DVI Notes were identical in all respects.²⁶ DVI was eligible to file a SEC Form S-3 for DVI #2, but chose to file only a prospectus on SEC Form 424B5 and DVI #2 traded in the dealer market only.

60. Because the second tranche was not listed on the NYSE, the price and volume data is incomplete for DVI #2 prior to July 2002.²⁷ Therefore, most of the analysis that follows will use data related to DVI #1. When available and relevant I will use for comparison purposes the less complete DVI #2 data. In

²⁶ Such as the overall structure, terms, covenants and provisions, including the seniority, redemption rights, interest payment dates, and maturity in February 2004.

²⁷ This is the date that the NASD's TRACE system began reporting trading information.

Section V, below, I will present evidence that demonstrates that the two tranches traded as if they were traded on one market. This makes sense since the Notes were perfect substitutes and arbitrage opportunities would likely dissipate any pricing distortion that might be discovered in one or the other of the markets.

C. The Cammer Factors

Cammer Factor I –Average Weekly Trading Volume

61. I use data from two sources to compute weekly volume measures for DVI #1. These sources include the daily trading statistics for the NYSE market for the period covering January 1, 1999 through the end of the Class Period and the daily data reported by NASD for the period covering July 1, 2002 through the end of the Class Period.²⁸

62. Exhibit XI presents the volume analysis for DVI #1. The results in Exhibit XI show that the average of the total weekly NYSE volume on the \$100,000,000 face amount is 0.23 percent.²⁹ This figure is obviously a lower bound of turnover since it excludes all dealer activity during the Class Period.

63. In Exhibit XI the average over the shorter period of the total weekly NASD volume on the \$100,000,000 face amount is 2.72 percent. The average of the combined total weekly NASD and NYSE volume on the \$100,000,000 face amount is 0.99 percent (or over one percent using the updated NYSE data discussed in footnote 29). Even though this figure excludes all dealer activity be-

²⁸ I had monthly total volume from Smith Barney; however, it appears that the information is mostly the same as the NYSE data. In addition, because purchases and sales are reported separately in the TRACE system I halved all the NASD volume figures I was supplied.

²⁹ Data received from the NYSE subsequent to creation of this analysis indicate that total NYSE volume over the Class Period was \$53,711,000 or \$5,525,000 more than the \$48,186,000 originally reported. This increases the average weekly turnover on the NYSE to 0.26 percent or an increase of almost 0.03 percent.

tween August 10, 1999 and June 30, 2002 and thus represents a lower bound estimate, it is still equal to the lower bound suggested by the Cammer court.

64. Another way to look at this is that over the Class Period using the actual volume information in Exhibit XI the turnover of the \$100,000,000 in DVI #1 Notes is approximately 2.1 times, given that total volume is \$206.1 million.

65. Because NASD did not report any information prior to July 2002, I extrapolated the NASD volume between August 1999 and June 2002, by assuming that the ratio of NYSE volume to NASD volume remained constant and was equal to the actual average ratio for the period of July 2002 through August 2003. I calculated the NASD volume between July 2002 and August 2003 as approximately 4.897 times the NYSE volume. This ratio suggests approximately 17 percent of the DVI #1 Note volume is on the NYSE. This is reasonable since independent empirical observation is that approximately 10 percent of the corporate bond volume takes place on the NYSE.³⁰

66. Using the extrapolated volume for the NASD I calculate that the average DVI #1 turnover over the Class Period is 1.36 percent. This means the turnover of the DVI #1 Notes (including the NASD extrapolation) was approximately 2.8 times, given that total volume is estimated at \$284.2 million.

67. I have also found that the level of volume for the DVI #1 Notes is high relative to the trading volume of most other corporate bond issues. Exhibit XII shows the trade distribution by frequency of trading, while Exhibit XIII

³⁰ Hwon, G. and A. Warga, "An Empirical Study of Bond Market Transactions," *Financial Analysts Journal* 56, 32-46 (2000) states, "The market for corporate bonds is conducted in both an exchange and a dealer environment. At least 90 percent of trades are carried out in the dealer market...."

shows the percentile distribution of trades, by time elapsed between successive trading days for a sample of over 20,000 corporate bonds.³¹

68. Overall, I observe that the DVI #1 Notes traded on the NYSE alone traded more frequently than almost all of the other 20,000-plus outstanding corporate issues. For example, in 2002, the DVI #1 Notes traded every 2.01 days or in 182 days during the calendar year. This suggests the NYSE trading activity alone placed DVI #1 in the top percentile of all corporate bonds in the sample. Even with only one-half year of observations from the NASD database in 2002, the DVI #1 trading activity indicates that the DVI #1 Notes were very active. The observed trading activity on the DVI #2 (using partial year data from the NASD) suggests the second tranche was also relatively active.

69. The relatively high average weekly trading volume of the DVI #1 Notes provides evidence supporting the conclusion that the DVI #1 Notes traded in an efficient market during the Class Period.

Cammer Factor II -- Analyst Coverage

70. Throughout the Class period, the major credit rating agencies were following and reporting on the DVI Notes. Historical ratings were provided by Moody's, Standard & Poor's and Fitch. These reports related to the credit rating of the DVI Notes and were in addition to the multitude of other information sources discussed in the previous section.

71. The continuous coverage of DVI by the credit agencies and the numerous disclosures on the company provides evidence supporting the conclusion that DVI Notes traded in an efficient market during the Class Period.

³¹ Chacko, George, Sriketan Mahanti, Gavrav Mallik, Marti Subrahmanyam, "The Determinants of Liquidity in the Corporate Bond Markets: An Application of Latent Liquidity," Working Paper, Harvard Business School (2005).

Cammer Factor III -- Market Makers

72. The third Cammer factor relates to securities traded over-the-counter or on NASDAQ because these securities are not traded on a centralized marketplace and thus include the trading by multiple market makers. The Notes registered to trade on the NYSE represented 65 percent of the face value of the DVI Notes traded throughout (and prior to) the Class Period. As I will demonstrate below, it is likely that arbitrage opportunities were available between the DVI #1 Notes that traded partially on the NYSE and the DVI #2 Notes that traded only in the dealer market. Since there is a general presumption that securities traded on the NYSE trade in an efficient market, it is likely that the DVI #1 Notes traded in an efficient market.

73. Furthermore, as will be shown below there were mostly dealers and institutions that traded both the DVI Notes. These dealers have characteristics much like market makers, standing ready to buy or sell. This provides evidence supporting the conclusion that DVI Notes traded in an efficient market.

Cammer Factor IV -- SEC Form S-3 Eligibility

74. As discussed above, DVI was not only eligible to file, but filed a SEC Form S-3 on numerous occasions listed in Exhibit III, including one such filing for the DVI #1 Notes. In addition, DVI filed two SEC Form 424B5 Prospectuses related to two public offerings for the Notes. These would include much of the same information as in a SEC Form S-3.

75. The fact that DVI was eligible to file on a SEC Form S-3 provides evidence supporting the conclusion that DVI Notes traded in an efficient market during the Class Period.

Cammer Factor V -- Price Reaction to Unexpected New Information

76. To detect whether the price of DVI #1 Notes reacted in a reasonable and timely fashion to relevant disclosures of unanticipated information, I perform another event study using a slightly different methodology.

77. To implement the event study related to DVI #1 Notes, I use DVI's Option Adjusted Spread ("OAS") as reported by FT Interactive Data. The OAS represents the firm-specific yield for DVI (i.e., DVI's yield net of the risk-less interest yield).³² Using the OAS is comparable to using the market model (discussed above with respect to the returns of DVI common stock) to adjust for market- and industry-wide factors related to the returns to DVI common stock. Like the market model, the OAS eliminates the impact of the risk-less interest rate (or the general market-wide factors), since the methodology calculates a comparable risk-free yield and nets it from DVI's observed yield.

78. First I calculate the standard deviation of the percentage change in the daily OAS over the two years preceding the Class Period. This is equal to approximately 5.4 percent. I then compute the abnormal daily bond returns by observing those days when the percentage change in OAS is more than 2.575 times the standard deviation (i.e., the percentage change exceeds 14.0 percent in absolute value). This indicates those days when the deviation of the daily change in yield is large enough to be statistically significant at the one percent significance level.

³² FT Interactive Data was the source on the DVI #1 Notes of the price, spread, comparable risk-less interest yield and Option Adjusted Spread. Analytics for FT Interactive Data is provided by Andrew Kalotay Associates, Inc. According to its website, this company "uses a proprietary tetra nominal lattice model employing Black-Karasinski interest process and a recursive valuation procedure" to calculate the OAS. This procedure would incorporate information on the provisions of the bond, as well as the time-to-maturity and coupon rates.

79. The daily OAS and the daily OAS percentage changes, along with the abnormal percentage changes are plotted in Exhibit XIV. The Exhibit identifies 26 days when the abnormal changes in yields are statistically significant at the one percent significance interval.

80. As before, in conjunction with the event study I also examine public disclosures (e.g., press releases, analyst reports, newspaper stories, company filings, etc.) to determine whether there is any “cause and effect” related to the disclosure of information on DVI and the observed abnormal returns. The important company disclosures are summarized in text boxes in Exhibit XIV, along with the related abnormal returns.

81. It is interesting to note that it appears that as the probability of default on the Notes rises (as is shown by a higher OAS), the OAS became more sensitive to DVI disclosures. While the probability of default was lower (as shown by a lower OAS) in the earlier period it appears that most of the abnormal yield changes are explained by random volatility and a few credit-related disclosures. This is consistent with the notion that as the company’s default risk increases the firm-specific information will become a more important factor in determining the corporate bond price relative to the risk-free interest rate.

82. The results in Exhibits XIV show that DVI Notes generally react quickly to new information, which is consistent with an efficient market.

D. Other Factors to Weigh When Examining Market Efficiency

83. In addition to those Cammer factors discussed above, I have also examined other factors that have been considered by the courts and/or discussed in academic literature.

Other Factor I – Institutional Holdings

84. During the Class Period, at least 26 large institutions and investment banks held over 90 percent of DVI’s two tranches of Notes. (See Bates

SGM018934). This document is not dated, nor can I determine whether the DVI Notes are held for the institutions' own account or for clients. As mentioned before, corporate bonds are generally held by sophisticated institutions for long term fixed income opportunities.

85. The fact that DVI Notes were held mostly by institutions provides evidence supporting the conclusion that DVI Notes traded in an efficient market during the Class Period.

Other Factor II -- Statistical Test for Autocorrelation

86. Finally, I conduct a statistical test using the regression reported in Exhibit XV to determine whether DVI #1 Note prices i.e., (daily percentage returns net of the risk-free interest effects) exhibit autocorrelation. In this case, I use a linear regression where the dependent variable is the return to DVI #1 bonds and the independent variable is the change in the risk-free yield.

87. Significant autocorrelation implies a statistical relation between security returns over consecutive days. A significant autocorrelation in the returns could indicate a violation of market efficiency. The statistical test I perform shows no significant autocorrelation at the five percent statistical confidence level for DVI Notes,³³ and is consistent with the conclusion that the market for DVI Notes is efficient.

³³ To test for autocorrelation I use a Durbin-Watson test. A Durbin-Watson statistic close to a value of two indicates no autocorrelation. The Durbin-Watson statistic computed for DVI is approximately 2.28.

V. EFFICIENT MARKET ANALYSIS RELATED TO THE INTERACTION OF THE DVI #1 AND DVI #2 NOTES

88. To consider if the two tranches acted “as if” they traded in the same market, I examine the relationship between the prices of DVI #1 and DVI #2 Notes. For this analysis I use the bond price and return data from FT Interactive data for the DVI #1 Note and various price observations from three sources for the DVI #2 Note. For the DVI #2 Notes I was provided transactions data from NASD for the eighteen days when the DVI #2 Notes traded in the dealer market between July 1, 2002 and August 13, 2003.³⁴ In addition, I was provided a daily price record for the whole Class Period from both PPM America, Inc. and Delaware Investment Advisors (which both held significant positions in DVI #2 Notes). When daily prices were available from two or three of the sources, I took the average to compute one daily mean price observation.

89. Exhibit XVI is a graph that compares the prices of DVI #1 and DVI #2 Notes. The graph shows a very highly correlation between the prices of the two bonds. In fact, the correlation of prices during the Class Period is in excess of 99.2 percent, which is not statistically different from one. The returns are also highly correlated between the two markets with a correlation measure of 78.5 percent during the Class Period, which is also not statistically significantly different than a correlation equal to one.³⁵

90. The graph in Exhibit XVI also includes the dollar price spread between the DVI #1 and DVI #2 Notes. Other than a few periods where there appear to

³⁴ For this analysis I used the last daily transaction as the market price.

³⁵ The correlations are all statistically significant at the one percent confidence interval. A correlation statistic equal to one means the two variables are move together in perfectly concert.

be relatively larger differences, (especially toward the end of the Class Period when the activity and volatility increase), the average absolute spread is only 0.78 percent during the Class Period and 0.68 percent for the period from July 1, 2002 to August 13, 2003.³⁶ The largest daily spread is 13.72 percent, but this is the observed spread on just one day, August 12, 2003. Prior to July 31, 2003, the largest daily spread is only 6.2 percent, also just on one day. In dollar terms the largest daily spreads are \$9.00 and \$6.19, respectively for the two periods. The average of the absolute dollar daily spread over the Class Period is only \$0.69 per \$1,000 face value.

91. The high correlations and relatively small price spreads between DVI's two tranches of Notes provides evidence supporting the conclusion that both of the DVI Notes trade in efficient markets.

92. In addition to the calculation of the correlation statistics and price spreads, I also analyze the 18 days when the DVI #2 Notes traded in the dealer market between July 1, 2002 and August 13, 2003. To determine whether there is some statistical price movements related to the activity, I observe the percent change in the OAS on the day before, of and after the trade took place. Exhibit XVII shows that in 14 of 18 days surrounding the trade date there is at least a one percent change in OAS; and in 10 of 18 there is a large enough percentage change surrounding the trade date to be statistically significant at the 99 percent level.

93. In addition, within one day following the trading activity in the dealer market for the DVI #2 Notes, the prices of DVI #1 and DVI #2 Notes converge. For the day following the trading activity, in 12 of 17 observations the spreads are less than one percent. Only after August 6, 2003 did the relatively narrow spreads widen. This observation is likely a function of non-synchronous trading

³⁶ On average the DVI #1 price is slightly greater than the DVI #2 price.

and high volatility associated with the announcement on August 4, 2003 of the missed interest payment and the subsequent disclosures.

94. The results related to the interaction of prices of DVI #1 and DVI #2 are consistent with an efficient market.

VI. CONCLUSION

95. Based on the Cammer and other factors it is my opinion that the preponderance of evidence presented in this report supports the conclusion that the common stock, the first tranche of DVI Notes and the second tranche of DVI Notes all traded in efficient markets.

RESPECTFULLY SUBMITTED THIS FIFTH DAY OF JULY, 2006

Michael L. Hartzmark, PhD.
Vice President
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